Lab 1

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Course: CSE4001 Parallel and Distributed Computing

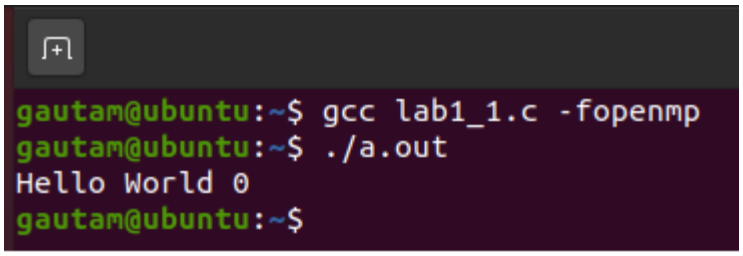
Q1. Parallel program to print hello world

Code:

```
#include <stdio.h>
#include <pthread.h>
#include <stdlib.h>
#include <omp.h>

int main() {
   omp_set_num_threads(1);
   #pragma omp parallel
   {
      int id = omp_get_thread_num();
      printf("Hello World %d\n", id);
   }
}
```

Output:



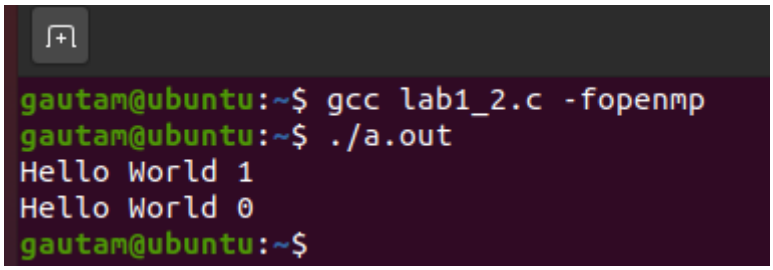
Q2. Parallel program to print hello world (2 threads and 4 threads)

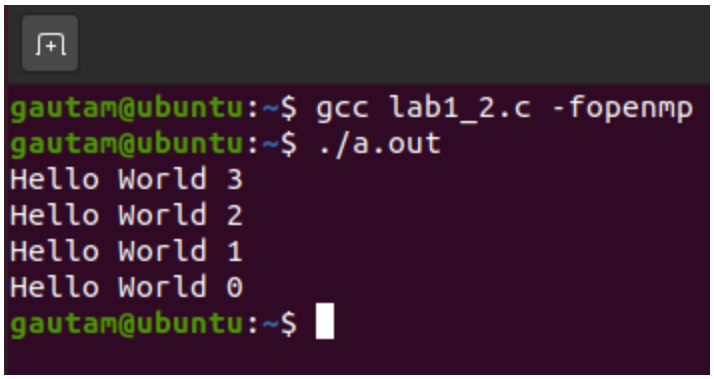
Code:

```
#include <stdio.h>
#include <pthread.h>
#include <stdlib.h>
#include <omp.h>


int main() {
   omp_set_num_threads(4);
   #pragma omp parallel
   {
      int id = omp_get_thread_num();
      printf("Hello World %d\n", id);
   }
}
```

Output:





Q3. Parallel program to add two arrays a and b

Code:

```
#include <stdio.h>
#include <pthread.h>
#include <stdlib.h>
#include <omp.h>
#include<sched.h>

int main() {
int a[10], b[10], c[10];
int i;
printf("Enter values of a[i] and b[i]\n");
for(i = 0; i < 10; i++) {
scanf("%d %d", &a[i], &b[i]);
}
#pragma omp parallel
{
for (i = 0; i < 10; i++)
{
c[i] = a[i] + b[i];
printf("CPU %d\tThread %d\tValue %d\n", sched_getcpu(), omp_get_thread_num(), c[i]);
}
}
printf("Values of c[i]\n");
for(i = 0; i < 10; i++) {
printf("%d\n", c[i]);
}
return 0;
}
```

Output:

```
gautam@ubuntu:~$ gcc lab1_3.c -fopenmp
lab1_3.c: In function ‘main’:
lab1_3.c:19:41: warning: implicit declaration of function
   19 | printf("CPU %d\tThread %d\tValue %d\n", sched_get
      |                                         ^~~~~~~~~
      |                                         sched_get
gautam@ubuntu:~$ export OMP_NUM_THREADS=4
gautam@ubuntu:~$ ./a.out
Enter values of a[i] and b[i]
1 2
3 4
5 6
7 8
1 4
1 9
2 9
2 5
3 7
3 8
CPU 0   Thread 0        Value 3
CPU 3   Thread 3        Value 3
CPU 3   Thread 3        Value 7
CPU 3   Thread 3        Value 11
CPU 3   Thread 3        Value 15
CPU 3   Thread 3        Value 5
CPU 3   Thread 3        Value 11
CPU 3   Thread 3        Value 7
CPU 3   Thread 3        Value 10
CPU 3   Thread 3        Value 11
CPU 2   Thread 2        Value 3
CPU 0   Thread 0        Value 10
CPU 1   Thread 1        Value 3
Values of c[i]
3
7
11
15
5
10
11
7
10
11
gautam@ubuntu:~$
```